equatorial and the sun to throw out the parts of the spectrum not under examination, and a concave cylindrical lens was used next the eye to reduce the apparent width of the spectrum, and thus increase its brightness.

From Professor Young's observations it thus appears that the coincidences are only near approximations, but a careful investigation by bringing together the bright-line spectra of the metals and the solar spectrum must be made in order to settle the question conclusively.

Mr. E. J. Stone has presented to the Royal Astronomical Society the complete sheets of his great Catalogue of Southern Stars, observed during his superintendence of the Royal Observatory, Cape of Good Hope. This very important work contains the places of between twelve and thirteen thousand stars, including, in addition to the stars observed by Lacaille, a considerable number of stars falling within similar limits of magnitude. "A stereographic projection showing the distribution of the stars contained in the Cape Catalogue, 1880, between 110° and 180° N. P. D.," has been lithographed by Mr. Stone.—*Nature*.

W. C. W.

As noted in the issue of last week, the volume of reports on the total eclipse of 1878, has been recently issued from the Naval Observatory at Washington. A few separate copies of the report of Mr. D. P. Todd, assistant in the office of the American Ephemeris and Nautical Almanac, have been reprinted, mainly for distribution among the gentlemen who co-operated in observing the duration of totality along the limits of total eclipse. Besides the usual observations of contacts, Mr. Todd had planned a search for supposed intra-mercurial planets, having provided himself with the four-inch comet seeker belonging to the Naval Observatory. At his station, however (Dallas, Texas), clouds intervened to such an extent that δ Cancri, a fourth magnitude star near the sun, could not be seen. This station was almost the only one of any importance at which clouds interfered on the day of the eclipse. Mr. Todd describes in his report a new method of procedure in the observation of total eclipses, whereby it would seem that the question of the existence of intra-mercurial planets might be speedily settled. An arrangement was concluded between Professor Newcomb (observing in Wyoming), and himself, whereby, if the former should observe any such object, its approximate position should be telegraphed immediately to the southern station for verification—there being about twenty minutes of absolute time intervening the arrival of of the moon's shadow at Wyoming and its reaching Texas. As Professor Newcomb observed no unknown object, there was, of course, no occasion for carrying out this scheme; but it will readily appear that, had the weather been clear at the southern station, and had the position of the objects seen by Professor Watson, been telegraphed for verification, the question of small planets near the sun might have been in a much less uncertain condition than it now is. It is to be hoped that astronomers may utilize this scheme on the occasion of the next total eclipse on the 16th of May, of next year. Eleven sketches and one lithograph plate of the corona accompany this report, but they do not exhibit any details of structure worthy of note. But by far the most importantant portion of Mr. Todd's report relates to the observations of duration of totality, which were made at his solicitation at numerous points along the northeast and southwest limits of total phase. This series of observations will afford a very accurate correction of the longitud of the node of the lunar orbit, whenever the geographical positions of the several stations have been determined it h sufficient accuracy to be used in the computation.

NOTE ON SUN SPOTS IN JANUARY, 1881.

To the Editor of "SCIENCE:"

1st, at noon: 5 groups, 11 spots. One spot quite large and close to east edge. Air very tremulous, making observation bad.

7th, 3 P. M.: 1 group, 3 spots. Two are large; nearly north of centre. Air bad. Observation with spyglass, power 36.

8th, 1 P. M.: 1 group, 4 spots. Air very bad.

10th, Noon: 1 group, 6 spots. Air very bad. Power 50.

11th, 2½ P. M.: 2 groups, 9 spots. One group of 7 spots 3′ from west edge. Two little spots and faculæ at east edge. Air pretty good.

17th, Noon: 1 group, 2 spots. A large spot near halfway from centre to N. W. margin. Observation with spyglass, power 36.

24th, 10½ A. M.: 3 groups, 23 spots. 12 spots, 2 quite large, south of centre. Air poor.

28th, Noon; 5 groups, 66 spots. One quite large and 5 good size, near west edge. Only good observation this month. The sun was hid most of the time.

Telescope 4.6 inches aperture; Power 100, except otherwise noted.

The number of solar spots has been slowly increasing since March, 1879. But it looks likely that the next maximum will be considerably more than eleven years from the last one, which occurred about August, 1870. The following minimum was nearly nine years afterward. It is generally about seven years from maximum to minimum, then four years to the next maximum. So I think it probable that the period, this time, will be about thirteen years, making the next maximum in 1883.

WM. DAWSON.

SPICELAND, IND., February 2, 1881.

CHEMICAL NOTES.

FORMATION OF BASES FROM SUBSTITUTED ACID AMIDES.—O. Wallach and Iwan Kamenski conclude, from their experiments, that if a base is formed by the action of phosphorous penta-chloride from a substituted amide of monobasic acids with a short carbon chain, two molecules of the amide enter into reaction in such a manner that hydrogen is derived from the hydrocarbon radicle pertaining to the acid in order to form hydrochloric acid.

ZINC CHLORIDE AS A REAGENT FOR ALKALOIDS, GLYCOSIDES, ETC.—A. Jorissen has found that the following bodies produce characteristic reactions with pure zinc chloride: Strychnine, bright rose; thebaine, yellow narceine, olive-green, delphinine, brownish red, berberine, yellow; veratrine, red; quinine, pale green; digitaline, chesnut-brown, salicine, violet-red; santonine, violet-blue; cubebine, carmine red. In case of strychnine the reaction can be produced with 1 decimilligrm. of the hydrochlorate. Brucine and aconitine, if present, interfere. To obtain the blue coloration characteristic of santonine, the mixture during evaporation must be continually stirred with a glass rod drawn out to a point. Digitaline gives first a green solution, similar to that produced by heating with hydrochloric acid. After evaporation there remains upon the porcelain a chestnut-brown spot which quickly blackens. The salicine reaction can be used for detecting the fraudulent addition of this body to quinine sulphate. Albumenoid substances, if heated for a time with the zinc chloride solution, leave a violet stain upon the porcelain, which may be distinguished by its instability from the colorations mentioned above. As a rule it quickly blackens. The author's method of operating is as follows: A solution of the alkaloid or its hydrochlorate is evaporated to dryness upon the water-bath, say in the inside of the lid of a porcelain crucible; two or three drops of the test-solution—1 grm. fused zinc chloride in 30 c.c. concentrated hydrochloric acid and 30 c.c. water—are placed upon the residue, and dried up afresh on the water-bath. The coloration begins at the outer edge and spreads inwards as the water is expelled.